15¢

TECHNOLOGY DEPT.
PUBLIC LIBRARY

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 15, 1944

For War Steel

See Page 42

A SCIENCE SERVICE PUBLICATION

Bearing up well

He's carrying quite a load but he's doing all right. And he's mighty grateful for your help — especially when Long Distance circuits are crowded.

Then the Long Distance operator may say — "Please limit your call to 5 minutes." Saving telephone time is important in wartime.

BELL TELEPHONE SYSTEM

MILITARY SCIENCE

New Bombing Technique

The Pathfinder method enables bombers to drop high explosives accurately on targets that cannot be seen with the naked eye. Smoke signals are used.

➤ FACTS about the Pathfinder bombing technique which enables bombers to drop their high explosives accurately on targets that cannot be seen with the naked eye have just been released.

This technique, originally developed by the Royal Air Force, was first used for night bombing on Aug. 18, 1942. Since then it has been used widely by both the British and Americans to put the Nazi war machine out of commission by repeated, deadly accurate bombing of targets through the clouds.

The equipment that makes this bombing possible consists of a Pathfinder device, and smoke signals, which are used to locate and mark the target.

The Pathfinder itself is one of the latest achievements of modern navigational science. It was invented by the Office of Scientific Research and Development. When a bomber is over the target it literally shouts to the bombardier, "Here's your target, drop your bombs." While further details of the actual operation of the instrument are still military secrets, it can be said that the Pathfinder gives the plane eyes to see through clouds and overcast from altitudes as high as 25,000 feet.

One plane, out of a formation of bombers, carries the special Pathfinder equipment, and a technically trained crew to operate it.

When the target is "sighted," the Pathfinder plane drops colored smoke bombs, if it is a daytime operation, or colored smoke flares, if at night. These planes leave a ring of colored smoke in the clouds marking out the target. Regular bombers that follow, release their bombs inside the colored smoke ring.

Two types of smoke bombs are now being used. The first type, known as the T. I. (for "target indicator,") was developed by the R.A.F. This bomb burns as it drops through the air, leaving a trail of colored smoke that will show up through all but the thickest cloud.

The other type of smoke bomb is the "Sky-Marker," developed by Lt. Col. Clarence H. Breedlove, Chemical Warfare Service, U. S. Army. The "Sky-Marker" is a special flare suspended from a parachute. The parachute descends more slowly than a bomb, leaving a larger cloud of colored smoke at higher altitudes than the target indicator.

The "Sky-Marker" is now a "standing operating procedure" for the Eighth Air Force, and has eliminated the element of doubt and rough estimations made at the time of bomb release by other planes. It has also decreased the size of the group bomb pattern, thereby giving density to the target.

The colors of the flares and smoke are changed each day, so that enemy smoke signals cannot confuse United Nations planes, and cause them to drop their bomb load on an open field instead of a military objective.

The Pathfinder technique is also used in the landing of paratroopers. Planes equipped with Pathfinder equipment go ahead of the troop carrier aircraft to select a suitable spot for the paratroopers to drop, beyond the range of enemy anti-aircraft fire. It marks this spot with a colored smoke bomb to guide the troop-carrying planes.

British Lancaster, Halifax, Mosquito, and Wellington bombers are equipped with Pathfinder devices. The only American planes, to date, to use this equipment are the B-17 Flying Fortress and the C-47 Skytrain.

It is known that Nazi scientists have been experimenting for a long time to develop a bombing technique similar to the Pathfinder system. However, there is no evidence that they have been able to duplicate it.

Science News Letter, July 15, 1944

AERONAUTICS

Super-Rockets "Fantastic"

➤ THE IDEA of super-rockets aimed at American cities and war industries from the coast of Europe is fantastic to anyone familiar with rockets and jet-propelled aircraft.

The haphazard way in which the robot bombs already launched against England are falling in and near London indicates that the Germans do not have exact control over the range or direction of these bombs.

This lack of control would seem to be the best evidence that the use of rocket bombs to terrorize the United States is impractical, to say the least.

If it were possible to launch rocket bombs from the French coast, have them span the Atlantic, and drop in the United States, they might land almost anywhere. If aimed at New York City, they probably would fall harmlessly in some pasture in Connecticut or New Jersey, doing nothing more than scaring a few cows.

Definite proof that transatlantic rocket bombs are impractical, if not altogether impossible, comes to light when we consider the question of weight. It would require 400 gallons of fuel an hour to carry a 12-ton bomb by jet propulsion across the Atlantic. The flight would take about 17 hours. The fuel weighs eight pounds a gallon. This means that it would take 3,200 pounds of fuel an hour, or about 55,000 pounds of fuel for the trip. The weight of the fuel would be greater than the weight of the explosive charge. The fact that the weight of the craft as a whole decreases as the fuel is used up would have little or no

ROBOT PLANE—Flying over a city Somewhere in Southern England, a pilotless plane heads for its target.

advantage as far as its military effectiveness is concerned.

If the rocket bombs could be flown in the stratosphere there is a slight possibility that they might be effectively used over moderately long distances, since the speed of such projectiles in the stratosphere is greater than at lower altitudes, and the amount of fuel needed is much less.

Should the Germans decide to use radio-controlled rockets to bomb the United States, it would be a simple matter for us to tune in the rocket frequency and cause them to drop harmlessly into the ocean, or turn about and head back towards Germany like boomerangs.

The facts seem to show that we have nothing to fear from transatlantic rocket bombs. The present state of progress in the field of rockets, jet propulsion, and aircraft in general does not indicate that such ocean-spanning terrors have been developed, or will be developed before the present war is over.

Science News Letter, July 15, 1944

HORTICULTURE

Soilless Farms on Islands

➤ FRESH VEGETABLES for United States Army Air Force personnel living on barren atolls and islands in the Atlantic and Pacific Oceans, and on isolated tropical posts will be provided by hydroponic or soilless farms now being established by the Air Quartermaster.

Growing vegetables by hydroponics, a system of raising green-stuffs in water with the use of chemicals, on isolated islands is not new. Experiments on Wake Island in the Pacific in 1938, using the system originated by Dr. W. F. Gericke of Berkeley, California, have proved that vegetables can be grown by this method. When the Japs captured Wake they acquired this pioneer installation (*See SNL*, May 14, 1938).

The vegetables are grown in boxes four by 11 feet. These are filled with water in which mineral fertilizer salts are dissolved in the right concentration to feed green plants. Over the tops of the boxes, wire netting is stretched, on which, supported in sawdust, excelsior, or other suitable material, tomatoes, peas, beans, carrots, and other vegetables grow, drawing their water and minor nutrients out of the tanks in which their roots dangle.

In experiments, tomatoes reached their maximum growth in about 2½ months. They were about the size of a baseball, had smooth skin with unbroken surfaces and fine texture as well as excellent flavor.

This water-chemical method of vegetable farming is not practical for a large number of troops, but has application in isolated areas for feeding a small number of men, according to the Air Quartermaster, Colonel H. R. W. Herwig.

"The serious problem of preservation in transportation and storage prevents men in some isolated areas from getting fresh vegetables," he stated.

Air Force pilots and crews need fresh vegetables rich in vitamins and minerals to keep them in the best condition for carrying out their missions successfully.

Gardens will be set up at Ascension Island in the Atlantic; Canton Island in the Central Pacific; Espiritu Island in the South Pacific; Port Moresby, New Guinea; and Karachi, India. It is expected that trained crews to establish and train other personnel in soilless gardening will leave the United States in 60 days.

Science News Letter, July 15, 1944

ASTRONOMY

Faint Double Star Is In Constant Turmoil

➤ A FAINT double star has been discovered to lead a life of constant turmoil. Material is ejected from the star, known to astronomers as HD 214419, with such force that its composition changes radically in less than twenty-four hours, Dr. William A. Hiltner of the Yerkes and McDonald Observatories of the Universities of Chicago and Texas states.

The greenish-white star is of about the ninth magnitude and therefore invisible without the aid of a telescope. Located near the less-familiar constellation of Lacerta, the Lizard, in the northern hemisphere, the Wolf-Rayet star is very massive and is one of the hottest of heavenly bodies.

Little is known about the companion star, but the more familiar component is made up largely of helium and nitrogen. The system varies periodically in brightness, although the Wolf-Rayet component has never been seen to be eclipsed. The variation is slight, however, and can be explained as due to reflection of the light of the other star on the Wolf-Rayet component, Dr. Hiltner reports in the *Astrophysical Journal*.

"Since the contribution by the companion star to the total light is appreciable, it is remarkable that no spectral features of the companion have been observed," the astronomer points out.

Science News Letter, July 15, 1944

SCIENCE NEWS LETTER
Vol. 46 JULY 15, 1944 No. 3

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. armed forces overseas, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents, $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rate from U. S. to destination.

Copyright, 1944, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STAte 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, American Philosophical Society; Otis W. Caldwell, Boyce Thompson Institute for Plant Research; Henry B. Ward, University of Illinois. *Nominated by the National Academy of Sciences;* Harlow Shapley, Harvard College Observatory; Warren H. Lewis, Wistar Institute; R. A. Millikan, California Institute of Technology. *Nominated by the National Research Council:* C. G. Abbot Smithsonian Institution; Hugh S. Taylor, Princeton University; Ross G. Harrison, Yale University. *Nominated by the Journalistic Profession:* A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Executive Editor, Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. *Nominated by the E. W. Scripps Estate:* Max B. Cook, Scripps Howard Newspapers; H. L. Smithton, Executive Agent of E. W. Scripps Trust; Frank R. Ford, Evansville Press.

Officers—President: Edwin G. Conklin. *Vice President and Chairman of Executive Committee:* Harlow Shapley. *Treasurer:* O. W. Riegel. *Secretary:* Watson Davis.

Staff—Director: Watson Davis. *Writers:* Frank Thone, Jane Stafford, Marjorie Van de Water, A. C. Monahan, Martha G. Morrow. *Science Clubs of America:* Joseph H. Kraus, Margaret E. Patterson. *Photography:* Fremont Davis. *Sales and Advertising:* Hallie Jenkins. *Business Manager:* Columbus S. Barber.

CHEMISTRY

Light, Soft Asbestos

Suits for fire fighters and coverings for pipes in homes may be made light as denim coveralls and soft as cotton fabrics.

➤ ASBESTOS SUITS for fire fighters and the asbestos which covers pipes in our homes may someday be as light as denim coveralls, and soft and pliable as cotton fabrics. Experiments conducted at the Polytechnic Institute of Brooklyn show that some of the fibers of chrysotile, a mineral forming the principal part of asbestos, are coarse and stiff; others thin and flexible.

In studying asbestos, X-ray defraction was used. But instead of having the rays strike the object from above, or from a variety of angles, small angle scattering down to angles corresponding to 500 angstroms is used, Dr. Raymond E. Kirk, head of the chemistry department, explained. The scattering of such small angles gives information not only about the crystal structure but about the particle size. These studies strongly suggest that the chrysotiles are composed of parallel fibrils—hexagonally packed.

Fibers of chrysotile have always been considered uniform in character, since all previously known tests showed no fiber differences. Experiments conducted with the low angle scattering method under Dr. I. Fankuchen, adjunct professor of crystal chemistry of the institute, however, showed the fiber diameters to vary according to the mine from which they came.

Chrysotile mined in such countries as Africa, Canada and the United States were studied. Of the mines so far investigated only a limited number provide these thin, flexible fibers which will make possible suits that are just as fireproof, but much lighter, than present asbestos garments.

X-ray diffraction can be used not only in studying materials used in manufacturing a product, but also in controlling the products during manufacture and in providing information on the finished material where data on the molecular structure is needed. Quartz crystals, used in incredible numbers in wartime radio sets, and titanium dioxide used in leg paint, need control during manufacture. Alloy steels and textile fibers should be analyzed upon completion.

In England, Dr. Fankuchen worked with Prof. J. D. Bernal of the University of London, who first made use of the technique of low angle scattering in connection with a study of proteins and virus diseases. Since returning to America a short time ago, Dr. Fankuchen has adapted this technique to the study of minerals and high polymers.

Some industries in the East are considering the use of X-ray diffraction, but do not have trained men in their laboratories. To meet this need, the Polytechnic Institute of Brooklyn is conducting an intensive clinic on "Industrial Applications of X-ray Diffraction" from July 10 to July 21, under the direction of Dr. Fankuchen. Industries in the East have been invited to select laboratory workers to send to the clinic.

Science News Letter, July 15, 1944

HALF A PLANE—This transparent model is intended to instruct pilots and ground crews in the latest developments in aircraft. It contains, clearly visible, all the functional systems of a plane in miniature.

AERONAUTICS

Schools on Wheels Keep Flyers Up To Date

➤ SCHOOLS on wheels, mobile instruction units, are being used by the Army and Navy to keep pilots and ground crews in war theaters up to date on changes made in the planes they are using.

Since it is not practical to bring ground or flight crews back to the United States from Africa, Italy, England, or Australia for re-schooling every time a change is made in the design or construction of the planes they are flying, the Technical Training Commands of the Army and Navy have developed 96 mobile training units on all the standard military aircraft. The units now in operation include P-38, P-47, P-51, A-20, B-17, B-24, B-25, C-54, the new Superfortress B-29, and many others.

Each training unit is a school within itself. It contains a number of instructional exhibits, covering every mechanical device used on the plane, from the engine to the bombsight. The actual aircraft parts are mounted on special panels which hinge together to form the sides of eight large boxes, for convenient, secure handling.

Each of the units is based on the latest "know-how" in assembling, installing and servicing the equipment and modifications—secret and otherwise.

The school is under the direction of nine men, expertly trained in operation of the engine, hydraulic system, instruments, electrical system, radio, fuel and heating, and other parts of the plane. The course of instruction is flexible, it may last two days or two months, depending on the circumstances.

The equipment is carried by truck trailer or by air.

Science News Letter, July 15, 1944

MEDICINE

Vaccine Against Viruses

➤ A VACCINE which gives mice "a high degree of protection" against the Lansing strain of infantile paralysis virus subsequently injected into their brains is announced by Dr. Albert Milzer, Dr. Franz Oppenheimer and Dr. Sidney O. Levinson, of Chicago (*Journal, American Medical Association,* July 8).

Human application of a similarly prepared vaccine is not even hinted at in the report. The vaccine for the mice was made by a new method of ultraviolet irradiation using a newly developed lamp as source of the ultraviolet light. With this lamp and technique the infantile paralysis virus, and also some other viruses and larger disease germs can be inactivated within one second. This destroys their disease-producing power.

The chief stumbling block to human application of the new vaccine, though not mentioned in the scientific report, would be lack of a supply of infantile paralysis virus to irradiate and make into a vaccine for humans. This virus cannot be grown in test tubes and a supply developed, as can be done, for example, with germs of typhoid fever. The only sources of infantile paralysis virus for vaccine-making are ground-up brains and spinal cords of human, monkey and mouse victims of the disease. This material would not furnish enough virus to make vaccines for human use.

The importance of the new vaccine consists in advancement of knowledge on the problem of immunity to viruses. The vaccine has the power of mobilizing in the blood of the vaccinated mice antibodies which neutralize the infantile paralysis virus. Viruses have this antigenic power only while they are living. The only viruses, apparently, which have antigenic power after they have been killed are the equine encephalomyelitis (so-called horse sleeping sickness) virus and, to a certain extent, the rabies virus.

Science News Letter, July 15, 1944

MEDICINE

Dysentery Treatment

➤ A RAW EGG white treatment for one kind of dysentery is suggested by experiments reported by Dr. Arthur L. Schade and Miss Leona Caroline, of the Overly Biochemical Research Foundation (*Science,* July 7).

Raw hen's egg white, they found, checks the growth of the Shigella dysentery germs and of other microorganisms, including a member of the staphylococcus family. The egg white achieves its effect by depriving the germs of iron. Germs which do not require much iron apparently are not affected. The Flexner type of dysentery germ is among those unaffected by the egg white.

Avidin, substance in egg white which produces serious sickness in some animals by depriving them of the vitamin, biotin, is not connected with egg white's effect on the microorganisms, so far as Dr. Schade has been able to observe.

For treatment of Shigella dysentery, Dr. Schade suggests giving the egg white by mouth in capsules coated so that they will pass unchanged through the stomach and reach the intestines where the germs are, or using the egg white in high colonic irrigations.

The new finding about egg white may also prove useful, he suggests, in studies of nutritional deficiency diseases and anemias because of the involvement of iron in the picture.

When iron is added to raw egg white in the concentration of the experiments, a tan to brownish color appears. The amount of the germ-growth-inhibiting factor in egg white can be determined by the depth of the color, Dr. Schade has found in studies continued after the report to *Science* was sent to press. Eggs vary in the amount of this factor.

Science News Letter, July 15, 1944

INVENTION

War-Winning Ideas Wanted From Civilian Inventors

➤ WAR-WINNING ideas are not necessarily all concocted by gold-braided generals and admirals at solemn staff conferences in Washington. Individual civilians sometimes turn in suggestions that can be translated into deadly blows against the Axis; and the National Inventors Council is now on the hunt for more of them, with a new list of 35 specific military problems for which solutions are being sought.

Means for both attack and defense are included among the items on the list—in some cases the Council wants both thrust and parry for the same weapon. For example, they invite submission of formulae for odorless poison gases, and at the same time they want a design for a gas mask that will permit the wearer to use his voice easily in giving orders and transmitting information. They are also interested in ointments that will protect the skin against drops of blister-causing chemicals like Lewisite.

In another department of chemical warfare, there seems to be no special present demand for more effective flame-weapons, but there is a definite call for fireproof clothing that will give protection against burning pieces of white phosphorus, as well as for protection against flame throwers. Also requested are suggestions on how to hold back fires in the interior of disabled tanks long enough to permit the crews to escape.

At the opposite extreme of requirements are requests for better protection of flyers and men at sea when plunged into icy water. Design of a life vest that will automatically inflate itself and turn the wearer on his back is needed for the preservation of men thrown violently overboard, unconscious from concussion. Desirable also are methods of carbon dioxide inflation of life rafts within 30 seconds, at temperatures of from 20 to 40 degrees below zero Fahrenheit.

Making the attack more effective receives particular stress in the new list of needed ideas. Getting the men ashore is a prime requisite, so that clearing of enemy obstacles is one field in which ingenious minds can find plenty of work. These obstacles may be either on or off shore; they may be boldly visible, concealed with camouflage on land, or submerged in the water.

Camouflage is another objective. Green paint now used will fool the human eye, though special camera filters tell readily enough which is real vegetation, which painted cloth. What is now wanted is some kind of aid to the human eye that will do the same thing instantly, without waiting for photographic films to be developed.

Pillboxes are still proving to be very tough nuts to crack. The Council list asks simply for "location and destruction of concealed enemy emplacements, pillboxes and similar strong points."

Science News Letter, July 15, 1944

MEDICINE

Injuries Affect Glands

Servicemen who have been burned or wounded may benefit from studies of the effects of injuries on body glands.

➤ BURNED and wounded servicemen may benefit from studies of the effects of burns on body glands reported at the meeting of the Association for the Study of Internal Secretions in Chicago.

The studies, under a contract between the Office of Scientific Research and Development and Wayne University College of Medicine, were conducted by Drs. Mary Beth Glendening, Helen A. Winter, H. H. Williams, W. E. Abbott, J. W. Hirshfeld and Carl G. Heller, of Wayne University, Detroit Receiving Hospital and the Research Laboratories of the Children's Fund of Michigan.

Important in rehabilitation of servicemen may prove the finding, if confirmed in additional patients, that sex gland function is disturbed in severe burns. Sex gland stimulating hormone was excreted in normal amounts during the first 20 days following the burn in the patients studied, but after this period increased amounts were excreted. Increased excretion of this hormone is an index of diminished male sex gland function, the scientists point out.

Changes observed in excretion of other hormones, indicating disturbed function of the adrenal glands, and of the body's handling of nitrogen from proteins, may lead to greater knowledge of the chemistry involved in repair of injured tissue. This may suggest new methods in treatment for burned and wounded servicemen.

Science News Letter, July 15, 1944

Why Fat Folks Eat

➤ FINDING out why fat people eat will throw more light on the cause of their fatness and how to cure it than all the present laboratory tests for gland disorders, Dr. Henry B. Richardson, of the New York Hospital and Cornell Medical College, told the meeting.

Contrary to the popular view, he said, not all people with endocrine gland disorders are fat and not all fat people have gland disorders. In the great majority of cases of obesity, no gland defect can be found and no consistent disturbances in basal metabolism, sugar tolerance or specific dynamic action have been observed.

Understanding of the fat person's motives for eating and being fat, not only the motives he gives but some of the symbolic meaning and psychological gain of the fatness, are important for curing the condition.

"The successful reduction of weight depends," Dr. Richardson said, "on the degree to which the psychological factors are understood by the patient or utilized in the treatment by the doctor."

Science News Letter, July 15, 1944

Quick Pregnancy Test

➤ A CHEMICAL test for pregnancy which can be completed in three hours and detects pregnancy at an earlier stage than the Friedman rabbit test was announced by Dr. Henry S. Guterman, of Michael Reese Hospital.

The test also appears to be more specific than the Friedman test, giving a negative reaction in conditions other than normal pregnancy in which the Friedman test may be positive.

The test is a qualitative color reaction for the presence in the kidney excretion of pregnandiol. This chemical is a degradation product of a pregnancy hormone and is excreted for only a part of every month unless pregnancy occurs. In that case, it continues to be excreted in increasing amounts. Its absence or the amount present at a particular time thus can be used to tell whether or not the woman is pregnant.

Science News Letter, July 15, 1944

Aids Reproduction

➤ VITAMIN D, given to babies in fish liver oil, is ordinarily thought of only as a requirement for formation of strong bones and teeth in growing children, though scientists have long known that grown-ups also needed some of this sunshine vitamin. Now it appears that it may be important to grown-ups who want children. Studies showing that, in rats at least, the reproductive function is closely dependent on the amount of vitamin D obtained were reported by Dr. Curt P. Richter and Dr. Katherine K. Rice, of the Johns Hopkins Hospital, Baltimore.

Science News Letter, July 15, 1944

Some 7,000,000 miles of *telegraph wire,* it is estimated, are stretched in land areas in the world, one-third of it is in the United States; this is a development of just a century—the first telegraph message was sent May 24, 1844.

ROCKET PROJECTILES—Just launched from special gear located under the wings of this R.A.F. Beau-fighter, halfway between the radial engines and the wing tips, these rocket projectiles are now on their way to their targets. Each plane carries eight rockets, four under each wing. They are fired along guide rails, either in pairs, or as a whole salvo. The U. S. Navy Grumman Avenger is also equipped to use the rocket missiles.

MEDICINE

Two Midge-Repellents Prevent Sandfly Fever

➤ BOTH DIMETHYL phthalate and a pyrethrum vanishing cream applied to the skin are effective repellents for the hairy, two-winged midges that carry sandfly fever, two Army officers and a civilian physician, Major Albert B. Sabin, Lt. Col. Cornelius B. Philip and Dr. John R. Paul, of New Haven, Conn., report *(Journal, American Medical Association,* July 8).

The disease, also known as Phlebotomus fever and pappataci fever, is of military importance because "it occurs in many parts of the world where troops are stationed and because it can incapacitate large numbers of persons at a time for seven to 14 days," the scientists point out.

It is a disease of hot, dry seasons, is caused by a filtrable virus, and has for its chief symptoms fever of two to four days, usually, with severe frontal headache, pain in the eyes, sensitivity to light, pain in the back, legs and arms, and changes in the white blood cells. It may be confused with dengue fever, which is spread by mosquitoes. There was some question whether an outbreak of a fever among American troops in Sicily was dengue or sandfly fever, but further investigation established this as sandfly fever.

Immunity or resistance apparently is developed, at least by some persons. Immunity may also be achieved by a virus irradiated by ultraviolet light.

Science News Letter, July 15, 1944

CHEMISTRY

Synthetic Tires of Rayon Are Cool and Last Longer

➤ SYNTHETIC automobile tires made with rayon cord are cooler-running, longer-lived, J. E. Hale, of the Firestone Tire and Rubber Company, reported to the Society of Automotive Engineers meeting in Philadelphia.

Synthetic tires develop higher temperatures than natural rubber tires under identical operating conditions: the higher the speeds, the greater the load, the greater the underinflation, the more this heat is built up.

Results of extensive tests conducted at the Firestone Research Laboratory show that tires made with cotton heat up faster, to higher temperatures, than those made with rayon, the speaker reported. In general, the air temperature in the tube is from 10 to 20 degrees Fahrenheit higher where cotton is used.

Pointing out that there will not be enough news tires this year to go around, Mr. Hale suggested that synthetic tires be sued so that they can be retreaded two, three, or even four times.

Mr. Hale made these recommendations to get the most out of synthetic tires: Put a limit on the car load, never carry a heavier weight than the tires will stand. Limit the speed; the higher the speed, the higher the temperature builds up. Avoid high sustained cruising speed; short bursts of speed do little harm. Check the tire pressures often to make sure that the proper pressure is in each tire; underinflation causes high heat to develop. Do not overinflate; overinflation places the cords under a higher tension and they are more likely to break. Retread before the tires are worn too far to take retreading.

Science News Letter, July 15, 1944

MEDICINE

Rice Diet Helps Patients With High Blood Pressure

➤ MUCH ATTENTION is being attracted by the report of a diet that seems to help patients with high blood pressure and kidney disease.

Dr. Walter Kempner, of Duke University, developed the diet and reported it to the American Medical Association. It consists solely of rice, fruit juices, sugar, vitamins and iron.

Dr. Kempner's theory is that one of the kidney's functions, that of deaminating the amino acids of protein, is disturbed by lowered oxygen supply and the result is high blood pressure. The rice diet was developed to reduce the amount of protein the kidneys have to handle and thus lower the amount of harmful, abnormal substances which he believes causes the high blood pressure.

Not all patients benefit from the diet, though no ill effects from it have been seen. Blood pressures were reduced in about 60% of the patients, he said. The diet, like that for diabetes, must be prescribed individually for each patient so far as amounts of rice and the other ingredients are concerned.

One nutrition authority listening to the discussion on whether the patients would be getting dangerously little protein from the diet, pointed out that the protein in rice differs from that in other cereals.

Science News Letter, July 15, 1944

IN SCIEN

MEDICINE

Use of Boric Acid Ointment On Burns Is Dangerous

➤ A WARNING against the use of boric acid ointment or saturated solution on burns was given by Lieut. Carl C. Pfeiffer, Ensign Lois F. Hallman and Lieut. I. Gersh, of the U. S. Navy at the meeting of the American Medical Association.

Enough boric acid to produce poisoning can be absorbed from 10% boric acid ointment, they found. As much as 75% may be absorbed when a 5% solution is used to wash out body cavities. Repeated doses result in the acid being deposited in the brain, fat and liver. Death results from a shock-like syndrome after large doses and from general inanition after medium doses.

After the Cocoanut Grove disaster in Boston, when boric acid ointment was used under pressure dressings on the victims' burns, the National Research Council issued an official recommendation for its use on burns, but this has since been withdrawn.

Since boric acid is a weak antiseptic, the Navy officers suggest use of more active and less potentially harmful ones.

Science News Letter, July 15, 1944

MEDICINE—AERONAUTICS

Evacuation by Plane Saves One-Third of Wounded

➤ DEATHS FROM battle wounds can be reduced by almost one-third (30%) if air evacuation can be used in all our major combat work. This is the firm conviction of Vice Admiral Ross T. McIntire, surgeon general of the U. S. Navy. "Casualty records still continue to be excellent," he reported at the meeting of the American Medical Association.

Shock is the "greatest single bugbear we are called upon to face," he said, citing experience at one field hospital where the doctors found that the two-mile ambulance ride over a very rough road from the airstrip to the hospital was responsible for the shocked condition in which patients arrived at the hospital. From such experiences doctors are learning ever better methods of handling.

Science News Letter, July 15, 1944

CE FIELDS

MILITARY SCIENCE

Blockbusters Create Artificial Tidal Waves

➤ SIX-TON blockbusters now create artificial tidal waves that destroy Nazi shipping along the coast of Europe. These heavy bombs, capable of making earth craters over 40 feet deep and 110 feet in diameter, have a devastating effect on boats when dropped in enclosed harbors, tidal basins and boat pens.

Artificial tidal waves are being used particularly in raids on the Nazi E-boat pens at Le Havre and Boulogne. The E-boats are similar to the U. S. Navy PT boats, and have been used by the enemy in attempts to stop the flow of supplies from England into Normandy.

The colossal waves set up by the bombs lift the E-boats clear out of the water and seriously undermine the structure of the large Nazi concrete boat pens.

Reconnaissance photos show that out of 20 boats the only shipping to remain intact after one of those "tidal wave" raids were a tank landing craft and six small auxiliaries. Five wrecked or partially submerged ships 150 to 200 feet long, and eight others of 100 to 150 feet were photographed.

In many instances E-boats simply vanish after one of these bombardments. "When all factors are taken into account," says the British official report, "it may be confidently asserted that they did not leave the harbor, but were sunk."

The new bombing technique was developed after R. A. F. bombers noticed that the greatest havoc seemed to be caused when the bombs missed the pens and fell in the water.

Science News Letter, July 15, 1944

ECONOMICS

Post-War Rubber Problem Predicted For Four Years

➤ THE WORLD may be facing a tight rubber situation for nearly four years after the war, unless we see fit to expand further our output of synthetic rubber. This view was set forth by Dr. R. P. Dinsmore, vice-president in charge of research and development of the Goodyear Tire and Rubber Company, at the meeting of the National Association of Purchasing Agents in New York City.

This is quite a different view from the one frequently expressed that the post-war market will be flooded with cheap crude rubber which will drive synthetic rubber off the market.

"It is important," Dr. Dinsmore pointed out, "because it means that synthetic rubber must not only meet our war needs, but must be able to cope with a large portion of our post-war requirements and all the changed conditions under which rubber products will be used."

Proceeding on the assumption that the war will be essentially completed, by a United Nations victory, by the end of 1946, Dr. Dinsmore estimated that the world's rubber demand may rise to 1,900,000 tons by 1950, with a total supply of 2,600,000 tons with which to meet it. Of this 2,600,000 tons, 1,525,000 tons will come from wild rubber or cultivated plantations.

"Of course," Dr. Dinsmore stated, "no one can say with certainty when the plantation areas will be recovered. Undoubtedly steps will then be taken for the rapid rehabilitation of the plantations. The reorganization of labor and replacement of equipment on large estates will be a difficult and tedious job. The attitude of natives may be uncooperative and international disputes are not unlikely."

Failure to get sufficient rubber from plantations would wipe out the surplus of rubber. Therefore, it will be necessary to expand our present synthetic rubber production in order to meet the demands of the post-war years and prevent an acute rubber shortage.

Science News Letter, July 15, 1944

INVENTION

Bomb Made From Fruit Jar Resembles Molotov Cocktail

➤ A HAND-FLUNG fire bomb of the "Molotov cocktail" type is the subject of patent 2,351,635, obtained by A. P. Prather and Ralph Russell, both of Georgetown, Ky.

Container for the incendiary fluid is an ordinary screw-top fruit jar. Secured to the cap is a handle, within which a smaller container is positioned so as to discharge a smaller amount of gasoline over a cloth or paper cover when the user is ready to fling his blazing missile. A friction igniter, controlled by a thumb strap, is provided at one side, to set fire to the cover just before throwing.

Science News Letter, July 15, 1944

NUTRITION

Moist, Bland Foods Often Involved in Poisoning

➤ FOODS most likely to be responsible for food-poisoning outbreaks are moist, bland ones, such as cream-filled pastries, spaghetti, macaroni, turkey or chicken stuffing, gravies and creamed dishes of various sorts. Certain types of salads, ham which has undergone a tendering process and, occasionally, corned beef also may give trouble. Germs that cause food poisoning grow well in such foods unless kept at very hot or very cold temperatures.

Foods which are dry, highly acid, highly spiced or with high concentrations of salt are likely to be free from the food-poisoning menace since such foods do not support bacterial growth.

Science News Letter, July 15, 1944

ENGINEERING

New Modern Cargo Winch Reduces Loading Time

➤ A MODERN method of electrical cargo winch control that reduces the time for loading and unloading Victory ships was described by F. H. Holt of the General Electric Company, at the meeting of the American Institute of Electrical Engineers in St. Louis.

The method of cargo handling consists of the use of two cables attached to the load. The first cable is fed over a boom which is swung above the hatch of the ship; the second cable is fed over a second boom above the dock. The load is lifted from the dock by the second cable. As soon as the load is sufficiently far above the dock so that it may be moved over above the hatch, the first cable pulls the load in above the hatch, and lowers it into the bowels of the ship for storage.

Using this method, there is hardly any swinging or jolting of the load, which is very important in the handling of easily damaged or broken cargo.

Either winch to which the cable is attached will hoist a load of 3,000 pounds at a speed of 290 feet a minute. When operating without a load they move at a speed of 400 feet a minute.

Each of the two winches is under the control of its own master switch. A special series of electrical combinations enables the winches to be operated at varying speeds to meet all conditions arising in the handling of light and heavy cargoes.

Science News Letter, July 15, 1944

MINERALOGY

Prospecting for Minerals

Geologists and engineers are combing the crust of the earth from Alaska to Tierra del Fuego for mineral riches. The war makes heavy demands on our supplies.

See Front Cover

➤ THE WORLD'S greatest treasure hunt is one of Uncle Sam's war jobs. Hundreds of federal engineers and geologists are combing the crust of the earth from Alaska to Tierra del Fuego for mineral riches. For minerals, used in staggering amounts to send our tanks, ships, airplanes, radios and guns into combat, must flow ceaselessly to our war plants.

To insure adequate stockpiles of strategic minerals, the Geological Survey and the U. S. Bureau of Mines are cooperating in the most extensive exploration and development program of mineral deposits ever undertaken in the United States. They are systematically investigating all known and potential sources of mineral wealth in this country, Alaska, Mexico and South America. Geologists play the role of detective in this program as they locate and map areas where drilling should be done to uncover concealed sources of metal. The Bureau of Mines follows through with the drilling operations and shaft-sinking that develop the deposit.

At the start of the war, 14 minerals were classified as "strategic" or "critical" by the Army and Navy. Today 53 minerals are placed on this list and the work is expanding.

More Ore Discovered

The swarms of fighters and bombers that are smashing German industrial centers and Jap-held bases in the South Pacific require aluminum, and aluminum comes from bauxite deposits. The tracking down of bauxite-bearing beds in Arkansas, Tennessee, Mississippi, Alabama and Georgia has been one of the most important jobs that has fallen to the geologists.

Drilling in these regions led to the discovery of more than ten million tons of ore of present commercial grade in addition to that already known.

Another mineral high on the strategic list is mica, required for condensers, radio tubes, airplane spark plugs and other electrical equipment. Before the war, the better grades of mica came from India. Today American geologists are engaged in a search for high-quality mica in Brazil, Colombia and Mexico, as well as in many parts of the United States.

The principal mica deposits in this country are in North Carolina, New Hampshire, Connecticut and South Dakota. Members of the Geological Survey are assisting in increasing the output of operating mines in these states, and in developing new deposits.

Tungsten Is Vital

Tungsten, another metal whose importance has rapidly increased in the past 20 years, today occupies a major position among those metals classed as strategic. It is needed in the preparation of alloy steels, of tungsten carbide, which rivals diamond as a cutting and abrasive material, and in certain chemical compounds. Other important uses are for filaments in incandescent electric lamps, radio electronic tubes and other radio parts, as electrodes for hydrogen welding and for electric contacts in automobiles.

Difficulties of transportation in the early part of the war made it impossible to count on continued imports of tungsten from China or other distant lands. An intensive study was made of our own reserves of tungsten ore and those of some of our Latin American neighbors to determine whether they might supply our wartime needs. Domestic ores now supply a substantial part of national consumption, even at wartime levels.

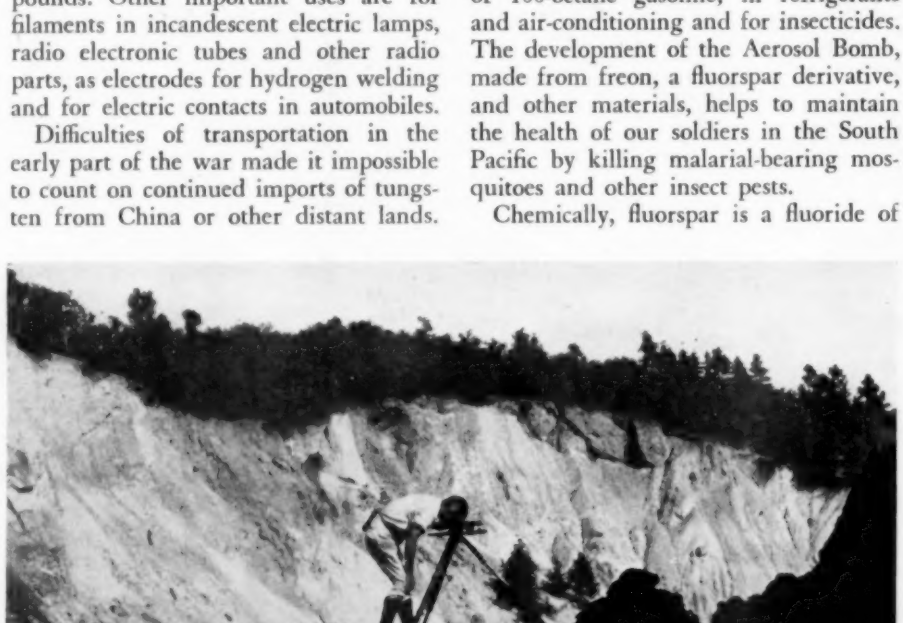
New Uses for Fluorspar

California, Nevada and Idaho are in the front ranks in production of tungsten concentrates. Located high in the Sierra Nevadas in California, the Pine Creek Mine is one of the three foremost deposits in the country. The production of this mine, together with that of the large deposits at the Yellow Pine Mine in Idaho and at Mill City, Nev., furnish approximately 80% of domestic concentrates and high-grade sorted ore.

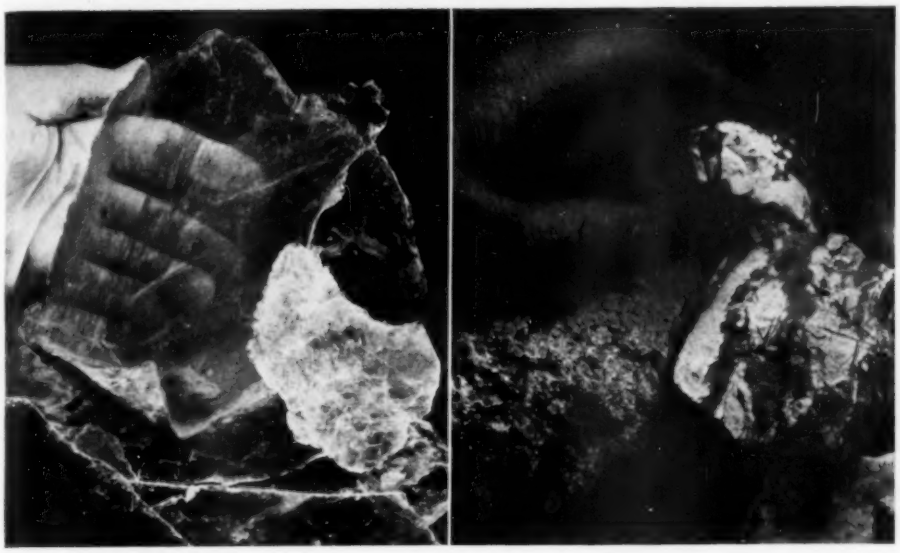
Fluorspar, a mineral with which few are familiar, is playing an important yet almost anonymous role in helping to shorten the war. Its work is far back in the industrial process.

New uses for fluorspar, resulting from wartime research, are in the production of 100-octane gasoline, in refrigerants and air-conditioning and for insecticides. The development of the Aerosol Bomb, made from freon, a fluorspar derivative, and other materials, helps to maintain the health of our soldiers in the South Pacific by killing malarial-bearing mosquitoes and other insect pests.

Chemically, fluorspar is a fluoride of



SIGHTING ORE—A geologist sights across an open-pit mine of iron-manganese ore in the U. S. Geological Survey's search for strategic minerals.



VITAL MINERALS—Needed for radio tubes, condensers and airplane spark plugs, the present supply of mica (left) is insufficient. Scheelite from which tungsten is made shines (right) under fluorescent light.

calcium, and has been used for many years in the manufacture of steel, four to six pounds being required as a flux in the production of each ton of open hearth steel. It is also used in the preparation of artificial cryolite, which is essential in making aluminum.

Natural cryolite is found only in Greenland, and during the height of the U-boat campaign our aluminum production would have been seriously curtailed if we had not been able to replace it with the artificial substance made from fluorspar. This use and the increased need for steel resulted in a serious shortage of fluorspar. Extensive investigations by the Survey led to the discovery of new ore bodies which insure an adequate supply of this war-mineral.

Rich Deposits

The most important fluorspar-producing region in the world lies in a small area that stretches from northwestern Kentucky across the Ohio River to southeastern Illinois. Intensive studies made by the Survey revealed many previously unknown deposits in this region, and drilling by mining companies and by the Bureau of Mines has paid off in important new supplies.

Actual and possible fluorspar-bearing deposits are also being studied by the Survey in Colorado, New Mexico, Utah, Nevada, Texas and other western states. Commercial quantities of the mineral have also been found in the east, particularly in New Hampshire and Tennessee.

Field parties have investigated beryl deposits scattered throughout Argentina, South Dakota, Colorado and Maine. Beryl is the source of the important alloy metal, beryllium. This metal is used in the production of tough copper alloys for calibrated springs in instruments of all kinds where permanence of the spring is vital, in electrical equipment and in safety tools to reduce the spark hazard where dangerous gases or liquids are present.

Search for Manganese

In many southern and western states, and in Cuba, Brazil and Chile the successful search continues for deposits of manganese, a metal absolutely necessary in the production of sound steel.

Deposits of tantalum recently discovered in New Mexico comprise the largest known source in the United States. This rare metal is needed now for radio tubes, steel cutting tools, wear-resistant parts of machines, portable radio transmitters, surgical foil and secret war uses. Although tantalum ore has been mined in small quantities in Wyoming, South Dakota and New Mexico, the principal source is abroad. The New Mexico deposits, if they meet expectations, will serve to supplement the meager sources available during the war.

To fill the needs of a nation at war, scientists are seeking more magnesium, which is lighter and stronger than aluminum, to make airplanes. They're also after moybdenum, antimony, mercury, copper, zinc, iron, indium, industrial diamonds, vanadium and a dozen other metals that go into the tools of war. In Alaska they are prospecting for chromium, coal, iron, mercury, tin, tungsten and zinc-lead.

As the needs of basic minerals for war change, so does the direction of the search. For it is the task of the scientists to keep war production plants supplied with materials for weapons of victory.

Science News Letter, July 15, 1944

PHYSICS

Rubber Engine Mounting Cuts Vibration in Bombers

➤ A NEW rubber mounting for engines of big bombers, like the Flying Fortresses, reduces vibration from the engines to a minimum. The new mounting makes the operation of the bomber smoother, decreases the strain on structural parts of the plane, lessens the nervous fatigue of pilots and crew, and increases the accuracy of precision instruments, resulting in more accurate bombing and gunfire.

The new mounting, developed under the direction of Dr. S. D. Gehman of the Goodyear Tire & Rubber Company, absorbs vibrations from the powerful radial engines, so that when the engine vibrates, the rest of the plane does not vibrate at the same time.

The mounts are used to attach the 1,200 horsepower engines to the tubular mounting ring which is welded into the plane structure. Each mount consists of two main parts. There is a collar, lined with a rubber bushing attached to the mounting ring with lugs. This collar has a socket in it, which is at right angles to the collar itself. The other half of the mounting, attached to the engine, ends in a ball which fits into this socket.

Vibrations developing in the engine are isolated by the ball-and-socket joint and by the rubber bushing in the collar. The ball-and-socket produces a unique rocking motion, so that the engine has a freedom of motion for every type of vibration that may occur.

While the new mounting is now used only on the Flying Fortress, it can be applied to all types of planes. It is expected that this rubber mounting will contribute greatly to the comfort of flying in postwar luxury airliners.

Science News Letter, July 15, 1944

Nitrogen fertilizer applied to apple trees in *foliage sprays* is supplementing time-honored methods of soil application of the urea fertilizer.

Do You Know?

A *new* bullet has a needle point for better penetration.

Mexico has large-scale plans to improve its *citrus* industry.

Cinchona plantations started in the Belgian Congo are expected to be producing *quinine* this summer.

Bad-smelling gasoline fumes may be eliminated by using *chestnut bark* tannin acid in the refining process.

Two-thirds of the world's people are normally engaged in *agriculture,* feeding themselves and the remaining one-third.

Kelp, or giant seaweed, is now collected on the west coast of Scotland in increased quantities to produce iodine and wrapping materials.

South Pacific island coconut palms furnish not only the meat and the milk of the nut but also a large *end bud* or "cabbage" that can be used as a vegetable, either cooked or raw.

Italians in 1911 dropped bombs on Arab tribesmen at Bengasi, Libya; this was probably the first use of airplanes for *bombing,* although balloons had been used earlier.

Swine hoofs, a waste product of packing plants, can make a good protein supplement for animal feeding when finely ground and mixed with other protein food.

A new *fuel tablet* for soldiers to heat their food is a synthetic compound known as trioxane, with a binder to hold it in solid form; one flat one-ounce tablet will heat a meal in about seven minutes.

Magnesium fires may be controlled by sprinkling coal tar pitch on them because the pitch softens and seals out air; water and other ordinary fire extinguishers make magnesium fires more intense.

A new plastic *fireproof upholstery* developed by a rubber company is reported as mandatory equipment in all new American combat vessels; it is unaffected by climatic temperatures and resistant to oils and gasoline.

MEDICINE

Ultraviolet for Studies

New light on the problem of mental disease may be gained from the glow of fluorescence. Certain disturbances may be linked with metabolism of porphyrins.

➤ THE SOFT glow of fluorescence may throw new light on the problem of mental disease, it is suggested by a report to the journal, *Science,* by Dr. Heinrich Kluever, of the Otho S. A. Sprague Memorial Institute, University of Chicago.

The glow of parts of the central nervous system when placed under ultraviolet light passed through a special filter betrays the presence of certain catalysts known as porphyrins. It is a light of a particular wavelength, 625 millimicrons. The detector is so delicate that it shows up a porphyrin when it is present in a concentration of only one part in one billion.

Dr. Kluever concludes as a result of his research that there is a possibility that certain nervous and mental disorders may be linked with a disturbance in the body's metabolism concerned with the handling of these porphyrins, which are the breakdown products of hemoglobin. He is now studying the amounts and distribution of porphyrins in patients with various illnesses of the central nervous system.

The following are some of the facts of Dr. Kluever's research, reported in *Science* (June 30) and in the *Journal of Psychology* (April), that may be of particular significance in the study of mental diseases:

In only one organ in man, monkeys and numerous other animals is there clear indication of porphyrins. That is the central nervous system.

The porphyrins are strongly affected by light. Although the distinctive fluorescence is still present in white matter taken from the brain or spinal cord of a dead animal after it has been boiled for 20 minutes, put in liquid nitrogen for two hours, irradiated with X-rays, or kept for 77 days in the dark, nevertheless 30 minutes in sunlight will destroy it. Dr. Kluever cites a previous discovery that 0.125 milligrams of coproporphyrin will kill mice exposed to light and that death comes even more quickly with other porphyrins.

This extremely light-sensitive substance is found in the optic nerve.

The distinctive fluorescence of porphyrins was found in all of the 19 different species or genera of mammals studied by Dr. Kluever, but was absent from the seven species of amphibians he studied. This probably means that it is exclusively characteristic of the mammalian and bird nervous systems.

It is present generally in the olfactory tract (odor sense) of the pig and dog, but weak or even absent in that of the monkey.

Science News Letter, July 15, 1944

CHEMISTRY

Three-Ply Plastic Gives Airmen Added Protection

➤ A NEW THREE-PLY plastic sandwich sheeting gives added protection to American airmen flying in pressurized high-altitude planes by acting as a self-seal, closing holes made by enemy bullets and flak, permitting maintenance of essential air pressure within the cabin. Solid, clear plastics usually shatter beyond repair when struck by a bullet in low temperature and under high pressure.

The new plastic consists of a single layer of polyvinyl butyral resin sandwiched between two layers of methyl methacrylate resin, the latter being known commercially as Lucite. The commercial name of the new plastic sandwich is Lucite-Butacite.

The new laminate, manufactured by E. I. du Pont de Nemours and Company, is transparent and readily adaptable to a variety of mounting techniques permitting design of enclosures, such as turrets, so that obstructing metal parts and ribs can be eliminated from the line of vision.

It is also expected that airplanes operating at lower altitudes will benefit from the new plastic because of the added safeguard against the shattering of enclosures in collisions with birds and against rupture from the impact of ice flying back after forming on the propeller.

At present, the entire output of the sheeting is allocated for direct war use.

Science News Letter, July 15, 1944

ECOLOGY

NATURE RAMBLINGS

by Frank Thone

Men of the Maquis

➤ TOUGH, hardy bushes have lately given their name to tough, hardy men.

"Maquis" (pronounced "mah-kee") is a word that has become prominent and frequent in the news, since the war has been successfully transplanted to the soil of France. We hear about the Maquis seizing this town, demolishing that power station, wiping out an isolated German detachment after cutting their telephone line. Practically always, the word is used as applying to the guerrilla fighters themselves; although originally confined pretty well to the south of France, we now hear about activities of the Maquis in other parts of the country.

Actually, until less than two months ago, "maquis" was a well-organized colloquial term, meaning in general the kind of tough, scrubby bush-and-small tree vegetation that grows on the semi-arid hills of France's Mediterranean slope. Nearest American-English equivalents would be "brush" or "scrub". Nearer yet would be the American-Spanish "chaparral" of our Southwest, and the similar country in upland northern Mexico.

Like the chaparral, the French maquis consists of an endless, monotonous, patternless array of bushes and small trees, most of them with harsh, stiff, leathery leaves, so that at first glance they all look pretty much alike. Closer acquaintance, however, discloses the fact that the maquis, like our chaparral, is made up of many plants with a rather wide array of botanical affinities. Scrub live-oaks tend to predominate, with laurels, holly and a few other species also prominent.

The monotony of appearance is an ecological response to the environment. In dry lands, where the little rainfall comes principally in winter but where evaporation rates are high the year around, long evolutionary experience has shown that a very few types of leaves are most efficient in conserving moisture, and that one of the most successful of these types is the small, tough, leathery kind, sometimes covered with grayish hairs, sometimes with a waxy or varnish-like coating, such as grow on live-oaks, holly and rhododendron.

Dry brushland of this kind of course has very little use or profit in it. The trees are rarely big enough to cut for anything but gnarled firewood, and most of the soil is so sterile and dry that it is not worth the labor of clearing for even dry-land farming. Great areas, therefore, lie practically empty and uninhabited, with roads poor, few and far between.

Such terrain is practically ideal for men who are "on the run" from the

The Microscope That Changed the Course of Science

Here you see one of the earliest Bausch & Lomb microscopes.

This was the first microscope produced by quantity production methods . . . the first precision compound microscope to be made at a price which the average research worker, educator or medical man could afford. These microscopes made research and study possible in America on an unprecedented scale.

Prior to this development of the mass production of precision optical instruments by Edward Bausch in 1876, the use of the microscope was restricted by high cost. Today the microscope is a familiar laboratory instrument in nearly every field of scientific endeavor.

With this rich background of experience, Bausch & Lomb makes the most complete line of optical instruments built by anybody anywhere, setting the pace in pioneering optical research, development and manufacture.

This is the experience that can be applied to the solution of your optical problems whether through a standard Bausch & Lomb instrument for research or control, or a completely new optical development for your specific needs.

BAUSCH & LOMB

OPTICAL CO., ROCHESTER, N. Y.

ESTABLISHED 1853

Makers of Optical Glass and a Complete Line of Optical Instruments for Military Use, Education, Research, Industry and Eyesight Correction and Conservation

SCIENCE INFORMATION

for Members of the Armed Forces OVERSEAS

IN order to serve the armed forces, Science News Letter recently offered its new monthly Overseas Edition to men and women outside the United States.

This special edition is geared to the armed forces—it contains scientific information interesting and useful to them. News important to us here, but not to them there, is cut out in order to pack the Overseas Science News Letter with the science information of greatest interest and use to members of our armed forces Overseas.

It is just sixteen pages (like the Science News Letter you are reading), but it is pocket size, printed on Air Mail weight paper, and the pictures and types are one-third smaller than the regular weekly edition. It is mailed by FIRST CLASS MAIL to service people Overseas each month, for $1.25 per year.

Order this Special Edition for friends and relatives in uniform Overseas on the coupon below. You need not get permission from the military authorities to make this gift; each issue will go quickly and in the same kind of mail as your personal letters.

To Science News Letter, 1719 N Street, N. W., Washington 6, D. C. For the enclosed $1.25, please send your Monthly Overseas edition.

PLEASE PRINT

To_____
First Name Middle Name Last Name

_____
Rank Serial Number

Address_____

_____

_____
Please print your name and address here

_____

_____

O-833

authorities. The few inhabitants will sympathize with these popular outlaws and help them by their intimate knowledge of trails, hideouts, and such springs and water-holes as may exist. Enemy ground forces unfamiliar with the terrain will almost certainly never find their quarry, and are very likely to get lost and finally ambushed themselves. Even airplanes are of little use, for men in dust-colored clothes crouching under dusty bushes are as invisible as quail that have taken cover against a hawk. Thus the maquis takes care of its own, even giving them its name.

Science News Letter, July 15, 1944

PUBLIC HEALTH

Veterans' Center

Blinded servicemen of the Navy, Marines and Army will be served. This step takes the Army further into the field of rehabilitation than it has gone before.

➤ THE OPENING of a rehabilitation center for blinded veterans this month at a former boys' school at Avon, Conn., announced by the War Department, marks two changes in Army procedure.

For one thing, although this center, to be known as the Old Farm Convalescent Hospital, will be operated by the War Department, blinded veterans of the Navy and Marine Corps as well as of the Army will be served.

Second, it seems to take the Army further into the field of rehabilitation than it has gone before.

Previously, the Army provided complete rehabilitation of the blind during the time they required hospitalization. Now the rehabilitation can extend beyond that to provide vocational training and training for social and personal adjustment after the period during which the man's condition requires his remaining in a hospital.

There will still be close cooperation with the Veterans' Administration, which will arrange for any necessary additional training after the man leaves the Old Farm Hospital, and will help him find a job and maintain contact with his employer in seeing that he makes satisfactory progress.

Among other advantages of the new plan, it was pointed out, is the fact that it will take the blinded men out of the Army and Navy hospitals more quickly than was possible before.

The new center does not replace the two special Army hospitals for the blind, one in Pennsylvania and one in California. Neither does it mean any great increase, present or expected, in the number of blinded veterans.

To date, there are 185 blind casualties from all the services. Not all of these are blind as the layman would define the term. Blindness in the services is defined as 20/200 vision or less in the better eye with maximum correction. Men who have 20/200 vision, it was pointed out, can get about and take care of themselves quite easily. They can not only perceive light but can shave themselves, walk without aid and do not need Braille for ordinary reading.

This amount of vision, however, would not be enough for a man to return to a job as bookkeeper, for example, or as mechanic having to read gauges. In such cases, the men need to learn how to do another job. At the new center, they as well as the totally blind will get vocational training.

Science News Letter, July 15, 1944

MEDICINE

Soldier Fights Many Months With Steel Over His Heart

➤ THE TOUGHNESS of G.I. Joes is attested to in the story, released by the War Department, of one of them who fought through months of the African campaign with a shell fragment lodged on his heart.

Wounded in the chest in March, 1943, this unidentified soldier went back to duty about a month later with his wound healed. In spite of bouts of pain and discomfort from the undetected shell fragment, he did not stop fighting until Aug. 30 when he was sent to a general hospital where X-ray examination showed the fragment and skilful Army surgeons removed it.

Majors Thomas D. Watts and Elam C. Toone, Medical Corps, formerly of the Medical College of Virginia, report the soldier is now well and restored to a useful life.

Science News Letter, July 15, 1944

• First Glances at New Books •

➤ FIRST of a new series of monographs under the able editorship of Theodore Just, THE ARGASIDAE OF NORTH AMERICA, CENTRAL AMERICA AND CUBA, by R. A. Cooley and Glen M. Kohls, sets a high standard for succeeding numbers to follow. (*Univ. of Notre Dame Press*, $2.)

Science News Letter, July 15, 1944

➤ SEED of grasses and legumes planted for hay and pasture is considered from every possible economic angle in THE FIELD SEED INDUSTRY IN THE UNITED STATES, by Frank Victor Beck (*Univ. of Wis. Press*, $3). There is a wealth of tables and many graphs on production, use, price trends.

Science News Letter, July 15, 1944

➤ A SCHOLAR'S BOOK about one of the great scholars of the immediately past generation, revered by hundreds of plant scientists now active as their father in botany, is the biography, JOHN MERLE COULTER: MISSIONARY IN SCIENCE, by Andrew Denny Rodgers III (*Princeton Univ. Press*, $3.75). Bridging in his own person and his long career the gap between Asa Gray and the present time, Coulter was indeed a giant of our own day. This volume is sourcebook as well as biography, for the author has done an exhaustive job of documenting every significant statement.

Science News Letter, July 15, 1944

➤ WOOD CHEMISTRY, edited by Louis E. Wise, is a symposium by 14 notable authors, digests and brings together in one convenient volume the great mass of data on the chemistry of wood and wood products pertinent to the present great crescendo of interest in this already tremendous and still growing group of industries. (*Reinhold*, $3.)

Science News Letter, July 15, 1944

➤ BIOLOGY has been popularly presented in a host of books; THE ROMANCE OF EXISTENCE, by Ross Bundy, however, is more than a popular exposition of the facts: it does some philosophizing (though not too much, and not too heavily) about significances in the development of individuals and the evolution. (*Pittman Publ. Corp'n.* $2).

Science News Letter, July 15, 1944

• Just Off the Press •

CITIES OF LATIN AMERICA, Housing and planning to the south—Francis Violich—*Reinhold*—241 p., illus., $3.50.

EXPERIMENTS IN GENERAL INORGANIC CHEMISTRY—J. L. Maynard and T. I. Taylor—*Van Nostrand*—550 p., illus., $2.90.

FERTILITY IN MAN, A Clinical Study of the Causes, Diagnosis, and Treatment of Impaired Fertility in Men—R. S. Hotchkiss—*Lippincott*—216 p., illus., $3.50.

FERTILITY IN WOMEN, Causes, Diagnosis and Treatment of Impaired Fertility—Samuel L. Siegler—*Lippincott*—450 p., illus., $4.50.

FREEDOM OF THE AIR—Keith Hutchison—*Public Affairs Comm.*—32 p., illus., paper, 10 cents. Public Affairs Pamphlets No. 93.

INTEGRATION—Edward James McShane—*Princeton Univ. Press*—392 p., $6.00. A treatise on higher mathematics.

MATHEMATICS FOR AIRCRAFT ENGINE MECHANICS—Harold Griffiths—*McGraw-Hill*—367 p., illus., $2.50.

MOSQUITO CONTROL, Practical Methods for Abatement of Disease Vectors and Pests—William Brodbeck Herms and Harold Farnsworth Gray—*Commonwealth Fund*—419 p., illus., $3.50. Second ed., revised and enlarged.

THE PEOPLE OF ALOR, A Social-Psychological Study of an East Indian Island—Cora Du Bois—*Univ. of Minnesota Press*—654 p., illus., $7.50.

PUBLIC SPENDING and Postwar Economic Policy—Sherwood M. Fine—*Columbia Univ. Press*—177 p., $2.50.

RECONVERSION—THE JOB AHEAD—J. A. Livingston—*Public Affairs Comm.*—32 p., illus., paper 10 cents. Public Affairs Pamphlet No. 94.

VEGETABLE AND FRUIT DEHYDRATION—A Manual for Plant Operators—Bureau of Agr. and Indust. Chemistry, Agr. Research Adm.—U. S. Dept. of Agric.—*Gov't Printing Office*—218 p., illus., paper, 30 cents.

Science News Letter, July 15, 1944

MILITARY SCIENCE

"Weasel" Moves Quickly

➤ THE "WEASEL," a new Army vehicle for use over snow, mud, or other treacherous terrain, carrying three passengers or light cargo, is now in use. It can readily climb 45-degree inclines, and can be turned in a 12-foot radius.

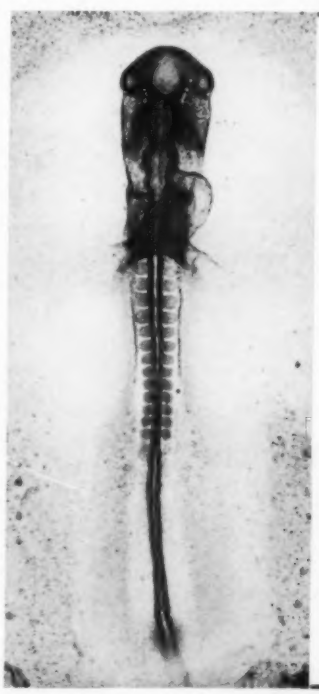
The new vehicle looks something like a cross between a jeep and a tank. It was developed cooperatively by the Office of Scientific Research and Development, the Ordnance Department, and the Studebaker Corporation.

Known officially as Cargo Carrier M-29, it has been nicknamed the Weasel because of its ability to strike swiftly and stealthily. The body of the new vehicle is low-slung, oblong, and square-cornered. Without its demountable canvas top and windshield, the Weasel is wider than it is high. The width measurement of 60 inches is more than half the length.

The driver sits directly behind the flat front, with the instrument panel at his right elbow and the engine beneath the panel.

The Weasel will remain on top of, and hold secure footing in soft, porous substances in which wheeled cars or conventional tanks would bog down.

Science News Letter, July 15, 1944



Looking FOR SLIDES THAT REVEAL STRUCTURAL DETAILS *Clearly... Accurately?*

TRY WARD'S. America's pioneer natural science supply house, Ward's knows the value in teaching of microscope slides that reveal structural details clearly and accurately. Technicians trained in modern science teaching methods prepare all of Ward's slide material. We invite critical comparison on quality and price basis of Ward's slides with any others. Write for catalog of slides for zoology, histology, embryology, botany, bacteriology and parasitology.

WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.
P. O. Box 24, Beechwood Station
ROCHESTER 9, N. Y.

•New Machines and Gadgets•

❁ *BARBECUE apparatus made from a used, and preferably aged, wine cask has received a recent patent. The sawed off upper third becomes a hinged cover. Holes in the sides permit air to enter. A fire pot and rotary spit are added. The cooked meat is wine-flavored.*

Science News Letter, July 15, 1944

❁ *SYNTHETIC soybean lacquer, developed by the U. S. Department of Agriculture, gives promise of being better and cheaper than most coatings for paper, films and foils. It is a transparent thermoplastic, greaseproof, waterproof, and resists acid and alkali. Technically an ethylene diamide polyamide, it will be known as Norelac.*

Science News Letter, July 15, 1944

❁ *RECTANGULAR road sweeping magnets, 18 inches wide and from five to eight feet long, are now available in a new form to clear roadways of nails and other metals that puncture tires. Suspended from the rear of a truck, the sweeper is magnetized by an electric generator on the vehicle.*

Science News Letter, July 15, 1944

❁ *MEASURING tape of steel, with scale markings on both sides, has a metal tangential extension on the reel through which the tape passes and which forms a handy grip for the user. The outer end of the extension is at right angles to the main part, so that it can be set squarely in a corner.*

Science News Letter, July 15, 1944

❁ *AIRPLANE window closure for passenger planes after the war operates horizontally as shown in the illustration. With it a passenger can screen all or part of the window.*

Science News Letter, July 15, 1944

❁ *COMB for waving hair without finger manipulation, newly patented, has two sets of teeth on the same back, one set projecting to the back as in an ordinary comb, the other at a small angle. The teeth in both sets, in part at least, have wavy conformation. In use it is drawn through the hair and given a half rotation, then removed.*

Science News Letter, July 15, 1944

❁ *A STILL to convert salty sea water into safe drinking water, small enough to be carried in a coat pocket, utilizes the rays of the sun and can supply a pint of drinking water in eight hours. It is particularly suitable in the tropics as it works more rapidly when the sun is overhead.*

Science News Letter, July 15, 1944

❁ *HIGH-HEAT oven for industrial infra red applications has its 250 watt lamps at one focus of an interior ellipsoid and the object treated at the other. This centers all radiations by reflection on the object. By use of multiple units an extended oven for continuous treatment is obtained.*

Science News Letter, July 15, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St. N. W., Washington 6, D. C., and ask for Gadget Bulletin 216.*

Don't Delay

getting that **new book** you want to read. SCIENCE NEWS LETTER will gladly obtain for you any American book or magazine in print. Send check or money order covering regular retail price ($5 if price is unknown, change to be returned) and we will pay postage in the United States. When publications are free, send 10c for handling. Address:

Book Department

SCIENCE NEWS LETTER

1719 N St., N. W. Washington 6, D. C.

Question Box

AERONAUTICS

How are American flight crews all over the world kept up to the minute? p. 37.

CHEMISTRY

How was X-ray defraction used in the study of asbestos? p. 37.

HORTICULTURE

How are vegetables grown on barren atolls and islands? p. 36.

MEDICINE

How are raw eggs used in dysentery treatment? p. 38.

How can you be poisoned by an ointment for burns? p. 40.

How is ultraviolet light used to gain a clue to mental disease? p. 44.

What two substances have been found to be effective in preventing sandfly fever? p. 40.

MILITARY SCIENCE

How do bombers hit their target accurately through fog? p. 35.

MINERALOGY

How many minerals are now on the "strategic" list? p. 42.

PHYSICS

How has vibration in bombers been cut down? p. 43.

PUBLIC HEALTH

Where is the new center for blind veterans located? p. 46.

Where published sources are used they are cited.

The imprint to the right is mailing address for your Science News Letter.

Date on lower line is expiration of your subscription.

Renew early to avoid lapse in service.

In requesting change of address please give your old address as well as the new one, at least two weeks before change is to become effective.